Pediatric Special Health Care Needs: Tracheostomy

I. All Provider Levels

1. Follow General Patient Care guidelines in section A1.
2. Establish patient responsiveness.
    A. If cervical spine trauma is suspected, manually stabilize the spine.
3. Check and open the airway.
    A. Assess the tracheostomy tube.
    B. If the obturator has been left in place, remove it to open the tracheostomy tube.
    C. If the child has a fenestrated tube, make sure the decannulation plug is removed.
    D. If suctioning is needed, follow step 11.
4. Position the child in a neutral position with a towel roll underneath the shoulders as needed.
5. Assess the patient's breathing including rate, auscultation, inspection, effort and adequacy of ventilation as indicated by chest rise.
    A. Obtain a pulse oximeter reading.

I. All Provider Levels (Continued)

6. If the child is in respiratory distress, attempt assisted ventilation through the tracheostomy tube.

   A. For ventilator-dependent children, follow the Ventilator protocol in section U2 in addition to the following steps.

> ***Note Well:*** *If the tracheostomy is a double lumen tube, the inner cannula must be in place for the bag-valve device to connect.*

7. Check pulse.

   A. If no pulse is present, begin chest compressions and follow the appropriate protocol.

   B. Follow the steps below for airway management.

8. Ask the caregivers for the child's baseline vital signs, if they are on home oxygen, and the amount and method by which they receive the oxygen.

9. Obtain a complete history including a history of the present illness, past medical history and interventions taken to correct the emergency before EMS arrival.

10. Call for ALS support.

    A. Initiate care and do not delay transport waiting for an ALS unit.

I. All Provider Levels (continued)

B. Deliver high flow oxygen by placing an oxygen mask directly over the tracheostomy opening or with manual ventilations. Insert 1 cc of normal saline into the tracheostomy tube every 15 minutes if humidified oxygen is not available.

> ***Note Well:*** *EMT-I and EMT-P providers may alternatively provide humidification through an in-line normal saline nebulizer*

11. Check breath sounds while ventilating. If breath sounds are not clear (or gurgling sounds are heard), suction the tracheostomy tube as follows:

A. If thick secretions are noted, inject 1 to 2 cc of sterile normal saline into the tracheostomy tube.

B. Use a suction catheter from the patient's supplies, if available.
   i. If unavailable select a suction catheter small enough to pass easily through the child's tracheostomy tube.

> ***Note Well:*** *To estimate the size of the suction catheter, double the inner diameter of the tracheostomy size. For example, a neonatal or pediatric inner diameter 3.5 tracheostomy tube (3.5 x 2 = 7) would take a size 6 suction catheter.*

C. If using a portable suction machine, set it to 100mm/Hg or less.

I. All Provider Levels (continued)

D. Determine proper suction catheter length by measuring the obturator.
   i. If the obturator is unavailable, insert the suction catheter approximately 2 to 3 inches into the tracheostomy tube.

> ***Note Well:*** *Do Not Use Force!*

E. Apply suction for no more than 10 seconds while slowly withdrawing the catheter, rolling the catheter between the fingers.

F. If unable to pass a suction catheter proceed directly to the next step.

12. If ventilation continues to be difficult, change the tracheostomy tube as follows:

> ***Note Well:*** *EMT-B's can only perform this step with the permission of Medical Control and in the presence of a knowledgeable caregiver.*

> ***Note Well:*** *This procedure requires the presence of two people. Initiate the help of a knowledgeable caregiver when available.*

A. Ask the caregivers for a replacement tracheostomy tube.
   i. If the caregivers do not have a replacement tube, follow steps B through E to remove the tracheostomy tube
   ii. Ventilate by placing the bag-mask device with an infant mask attached, directly over the stoma.
      a. Cover the child's mouth and nose.

I. All Provider Levels (continued)

iii. Alternatively, the child can be ventilated by placing a mask over the nose and mouth and covering the stoma.

B. If the child has a cuffed tracheostomy tube, deflate the balloon by connecting a syringe to the valve on the pilot balloon.
   i. Draw air out until the pilot balloon collapses.

> ***Note Well:*** *Do not cut the pilot balloon, as this will NOT deflate the cuff. If the pilot balloon was cut, DO NOT remove the tracheostomy tube—Contact medical control.*

C. If the child has a double cannula tracheostomy tube, remove the inner cannula.
   i. If removal of the inner cannula fails to clear the airway, the outer cannula should then be removed after performing the step D.

D. Cut the cloth or Velcro ties that hold the tracheostomy tube in place.

E. Remove the tracheostomy tube using a slow, outward and downward motion.

F. Gently insert the same-size tracheostomy tube, with the obturator in place. Point the curve of the tube downward.

> ***Note Well:*** *The tracheostomy tube may be lubricated with a water-soluble gel or normal saline.* ***DO NOT FORCE THE TUBE!***

I. All Provider Levels (continued)

G. If the tracheostomy tube cannot be inserted easily, withdraw the tube and attempt to pass a smaller size tracheostomy tube.

> ***Note Well:*** *The EMT-I and EMT-P can attempt to insert an endotracheal tube (ETT) if a smaller tracheostomy tube is not available or cannot be inserted.*
>
> *Select an endotracheal tube with an inner diameter equal to or smaller than the inner diameter of the last tracheostomy tube attempted. Make sure the outer diameter of the endotracheal tube is smaller than the outer diameter of the tracheostomy tube most recently attempted.*
>
> *Attempt to insert an endotracheal tube no more than two inches into the opening. Aim the tip of the endotracheal tube downward to prevent tissue damage after passing it through the stoma. If the endotracheal tube has a cuff, inflate the cuff after checking proper placement.*

H. If a replacement tube cannot be inserted, ventilate by placing the bag mask device with an infant mask attached, directly over the stoma.
   i. Cover the child's mouth and nose.
   ii. Alternatively, the child can be ventilated by placing a mask over the nose and mouth and covering the stoma.

> ***Note Well:*** *If ventilations fail through the mouth and nose, or stoma, insert a suction catheter approximately two inches into the stoma. Connect to oxygen at rate prescribed by medical control. Transport immediately.*

I. If the tracheostomy tube is successfully placed, assess breath sounds, then secure the tube with the tracheostomy ties.
   i. If an ET tube was placed and there is chest rise and equal breath sounds with manual ventilation, secure the tube with tape.

Note Well: *Do not cut the endotracheal tube to make it shorter.*

J. Reassess breath sounds every 3-5 minutes.

13. If breathing is adequate, place the child in a position of comfort and administer 100% oxygen by placing an infant mask directly over the stoma (or as tolerated by the child).

    A. If patient is ventilator-dependent, manually ventilate patient by placing an infant face mask directly over the stoma.

14. Obtain the child's medical history from the caregiver, including a history of the present illness and past medical history.

15. Assess circulation and perfusion.

I. All Provider Levels (continued)

16. If bronchospasm is present in a patient with adequate ventilation, administer 2.5 mg albuterol via nebulizer over a 10-15 minute period by placing the aerosol mask directly over the tracheostomy tube.

    A. If the patient is being assisted with ventilations, set up an in-line albuterol nebulizer treatment and administer directly through the tracheostomy tube.

    B. If bronchospasm persists, repeat 2.5 mg albuterol once (total 2 doses).

Note Well: *EMT-I and EMT-P providers may give an additional 2.5 mg of albuterol if bronchospasm persists for a total of 3 doses.*

II. Advanced Life Support Providers

1. If ventilation is successful through the nose and mouth, and a replacement tracheostomy or ET tube is unable to be passed through the stoma, orally intubate with an appropriately sized endotracheal tube.

2. Initiate cardiac monitoring.

    A. Treat any arrhythmias following the appropriate protocol.

III. Transport Decision

1. Initiate transport to the nearest appropriate facility as soon as possible.

2. Bring any of the child's medical charts or medical forms that the caregiver may have, as well as any supplies that the caregiver may have for the tracheostomy tube.

> ***Note Well:*** *Some caregivers carry a "go bag" for their children with extra supplies. Ask the parent if they have a "go bag" or similar bag for their child and bring it to the hospital.*

3. If the child has a ventilator or apnea monitor, bring it to the hospital.

4. Perform focused history and detailed physical exam en route to the hospital.

5. Reassess at least every 3-5 minutes, more frequently as necessary and possible.

IV. The Following Options are Available by Medical Control Only

1. Additional repetitions of 2.5 mg albuterol via nebulizer. For EMT-B's, this is necessary past the second dose administered. For ALS providers, this is necessary past the third dose administered.

This protocol was developed and revised by Children's National Medical Center, Center for Prehospital Pediatrics, Division of Emergency Medicine and Trauma Services, Washington, D.C.

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